

Statement of

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on

Issues Facing Communities with Decommissioning Nuclear Plants

**Before the
Committee on Environment & Public Works
Subcommittee on Clean Air, Climate, and Nuclear Safety
United States Senate
Field Hearing in Plymouth, MA
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Introduction

Mr. Chairman, Ranking Member, Senator Markey and other members of the Committee, thank you for inviting the Natural Resources Defense Council (NRDC) to Plymouth, Massachusetts and providing us this opportunity to present our views at this field hearing on the issues facing communities with decommissioning nuclear power plants and the associated proposed rule of the Nuclear Regulatory Commission (NRC).

NRDC is a national, non-profit organization of scientists, lawyers, and environmental specialists, dedicated to protecting public health and the environment. Founded in 1970, NRDC serves more than one million members, supporters, and environmental activists with offices in New York, Washington, Los Angeles, San Francisco, Chicago, Montana, and Beijing. NRDC has worked on nuclear issues for over four decades and continues to be engaged in shaping U.S. law and policy on the nuclear fuel cycle.

Summary of Comments

Almost precisely eight years ago I spoke before the full committee in Washington, D.C. about this topic, and I was excited to do so. The newly inducted Commissioner Baran and many others directed the attention of the Commission and this Committee to the first truly serious reckoning with the task of decommissioning nuclear power plants after decades of operations. At that time and still to this very day, NRDC sees the matter of decommissioning commercial reactors as something that should be straightforward, methodical, and not particularly controversial. The single largest issue facing communities is the lack of clear set of strong, protective guidelines on how decommissioning will move forward. Unfortunately, NRC has issued a proposed rule that does not meet this need and that will be the subject of our testimony today.

As a topline message for this Committee, whatever rule is finally adopted by the NRC will likely be in place for decades and could very well affect the cleanup, the communities, and the associated workforces of more than sixty sites across the country. And this proposed rule, in its current form, is severely inadequate and should therefore not be adopted. Rather, NRC needs to go back to the drawing board in some key areas and fashion a rule that meaningfully protects communities, workers, and the environment. Many of the challenges we've seen here in Massachusetts could have been avoided with an improved set of regulatory requirements. Let's not revisit those harms and struggles on other communities in the future. After setting out a brief background on the rule itself and why it's long overdue, we will stress three major points for today's hearing on specific areas for improvement.

First, well in advance of reactor shutdown and moving into decommissioning, the NRC must require a decommissioning plan that allows for a full environmental review of the necessary cleanup and meaningful hearing rights that allow the agency to fully inhabit its role as a regulator. Next, it's crucial to require the industrial cleanup that is the decommissioning process to take place as soon as practicable after a reactor shuts down and with the retention and distinct advantages of the skilled, existing workforce. Waiting decades to move on the cleanup harms communities and larger state interests while also losing the significant advantages of a workforce that knows the facility inside and out. And finally, we briefly discuss the constructive prescription presented by Commissioner Baran that would ensure adequate funds and resources

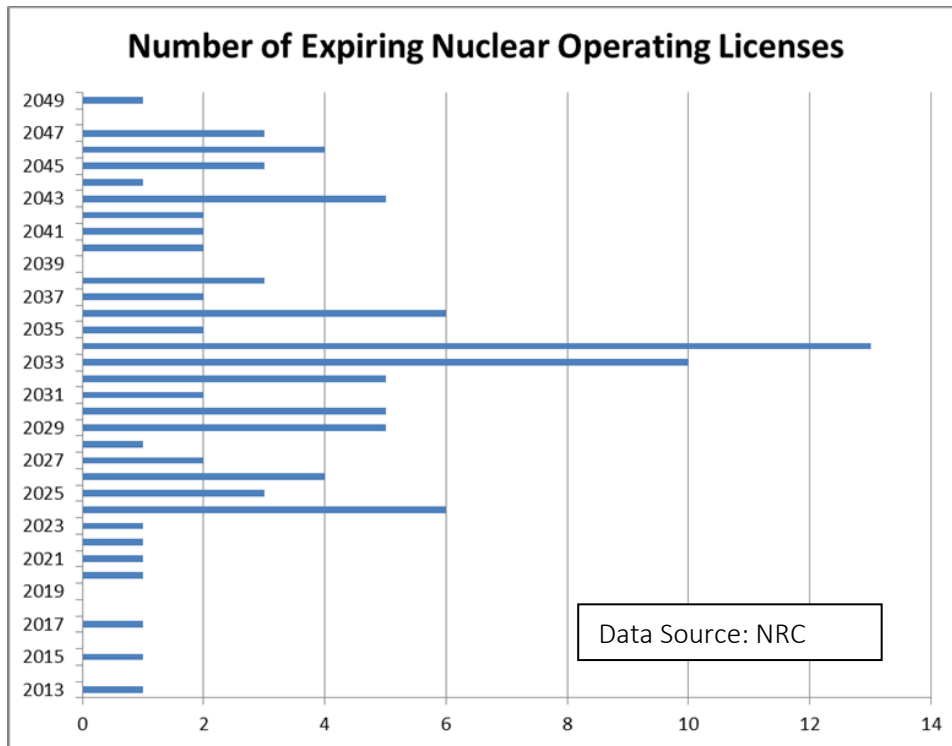
are available when necessary for the cleanup, communities and workforces that will depend on them.

Background

For the first three decades of the atomic age, federal and industry attention to nuclear matters was almost entirely directed at nuclear weapons production and commercial nuclear power generation. Disposal of spent nuclear fuel and the mounting radioactive by-products of nuclear weapons production, and the eventual decommissioning of commercial and defense facilities, were hardly on the radar screen. It was not until the 1980s that serious interest, effort, and money was devoted to the task of decommissioning and properly disposing of nuclear power plants themselves. And it took until 1996 for the NRC set forth the first basic tenets for a decommissioning rule. Those inadequate requirements are still in place today. Indeed, an NRC Atomic Safety & Licensing Board acknowledged, “[t]he NRC has never promulgated comprehensive regulations governing the decommissioning of nuclear power reactors.” *In the Matter of, Entergy Nuclear Vermont Yankee, LLC, and Entergy Nuclear Operations, Inc. (Vermont Yankee Nuclear Power Station)*, 81 NRC 793, LBP-15-18 at 3 (May 18, 2015).

But with the gradual drumbeat of retiring reactors in the past few years for varied aging, safety, and economic reasons – Crystal River in Florida, Kewaunee in Wisconsin, SONGS in Southern California, Vermont Yankee in Vermont, Fort Calhoun in Nebraska, Oyster Creek in New Jersey, Indian Point in New York, and now Pilgrim here in Massachusetts – there is consensus we need to address this matter.

Moreover, while there is an effort to extend the operating life of reactors to 80 years and federal and state subsidies supporting extensions, much of the current fleet will, for a combination of economic competitiveness and safety reasons, shut down and enter the decommissioning phase at some time in the next couple of decades. Below you will see a chart that denotes the current retirement date. We fully expect this chart to be altered in significant measure as many reactor operators may attempt to extend their licenses out to 80 years of operation, but we would also not be surprised if many utilities passed on the opportunity as the associated costs and scale of investment necessary to operate safely and economically will no longer pencil out compared to cheaper, safer and more dispatchable renewable and efficiency alternatives. In either case, this is just a snapshot in time and we fully expect these figures to change.



Spurred on by these facts, the arrival of Commissioner Baran in 2014, and the work of the rest of the Commissioners, NRC finally began work on addressing decommissioning. First came an Advanced Notice of Proposed Rulemaking (80 Fed. Reg. 72358, Nov. 19, 2015). Next came the agency’s Draft Regulatory Basis. (82 Fed. Reg. 13778, Mar. 15, 2017). And finally, years later than initially expected came the Proposed Rule (87 Fed. Reg. 12254, Mar. 3, 2022).

Until the small bump of reactor shutdowns over the past decade, only a few large commercial power reactors had been decommissioned in the United States, and therefore our experience with the process was comparatively limited. But this is changing right before our eyes, here in Plymouth and other locations.

And just a top line examination of what has already transpired in decommissioning reveals a host of serious issues and challenges that a rule can address – including the need for clear regulatory requirements rather than exemptions from operating protocols, timelines, workforce retention and the adequacy of funding resources to do the job. Lessons learned on what has worked (and what has not) are readily available to the NRC. Rancor and discord over skilled workforce retention, cleanup standards, waste management practices and other matters important to the states, communities, and environments that have hosted and supported reactors can be avoided with a transparent, scientifically defensible, and publicly acceptable decommissioning rule. Unfortunately, the proposed rule in its current form will not accomplish these goals.

II. The proposed rule in its current form

The NRC described its task at the outset of the proposed rule:

The NRC is proposing to amend its regulations related to the decommissioning of production and utilization facilities. The Commission directed the NRC staff to proceed with an integrated rulemaking on nuclear power reactor decommissioning to address the following: A graded approach to emergency preparedness (EP), lessons learned from the licensees that have already gone through (or are currently going through) the decommissioning process, the advisability of requiring a licensee's post-shutdown decommissioning activities report (PSDAR) to be approved by the NRC, the appropriateness of maintaining the three existing options for decommissioning and the timeframes associated with those options, the appropriate role of State and local governments and non-governmental stakeholders in the decommissioning process, and any other issues deemed relevant by the NRC staff.

87 Fed. Reg. at 12254.

After nearly 8 years of work since its inception, the NRC has issued a proposed rule where several of the key issues are remarked upon but meaningful requirements are not imposed, and communities that host nuclear power plants have no clear sense of the rules of the road. For example, under the proposed rule, the NRC simply *acknowledges* the receipt of a decommissioning plan (PSDAR), but requires nothing else; industry alone sets time limits for doing the decommissioning work out a potential 60 years which allows for jettisoning the entire skilled workforce; there is a relaxation of emergency preparedness and other matters such as spent fuel storage; the management of the decommissioning trust funds and offsite and onsite financial protection requirements and indemnity agreements are weakened.

In short, the draft is focused on reducing industry "burdens" and providing industry "flexibility" rather than addressing the important needs of states and communities or the necessity to leave behind a clean environment.

In his disapproval of the proposed rule as iterated, Commissioner Baran accurately summarizes:

[T]he licensee makes the key decisions with a minimal role for NRC and almost no role for any other stakeholders. This approach is embodied by the current regulation, which was issued in 1996, and the draft proposed rule, which goes even further down this path. We need to change course and produce a balanced rule that respects the interests of a broad range of stakeholders, including states and local communities. The current regulatory requirements established in 1996 are not balanced, and the draft proposed rule would make the situation even worse, further skewing the regulation towards the interests of industry. Right now, NRC is pretty hands off when it comes to decommissioning. NRC conducts safety inspections but allows licensees to make virtually all of the major decisions. The basic justification offered for the present arrangement and for the draft proposed rule is that shutdown nuclear reactors pose less radiological risk than operating reactors.

Baran Disapproval at 1.

The Commissioner goes on to conclude:

Every current and future nuclear power plant will eventually be decommissioned. It is therefore essential that NRC establish specific requirements for decommissioning reactors. Unlike NRC's existing decommissioning framework, these new requirements must be balanced – not skewed in favor of one group of stakeholders or designed to sideline NRC. The draft proposed rule misses the mark. NRC needs a course correction to strike the right balance. We can and must do better.

Id. at 16. We agree.

III. Major Objections to the Draft Rule

A. Decommissioning Plans - The NRC Should Act Like a Regulator.

The decommissioning process is the shutdown and cleanup of a massive industrial facility that has been in operation for decades. It is a more complicated and painstaking endeavor because the facility is both highly radioactive and toxic. Under well-established American law and regulation, one might expect this activity would elicit significant environmental analysis, specific worker protections, and thorough regulatory requirements. One might also expect that these regulations would require a methodical, transparent roadmap that is presented to the respective state and surrounding communities for review, public comment, and potential adjustment to ensure that the environment, workforces, and communities are best served during this long cleanup process.

Alas, this is not the case with this proposed rule. The NRC succinctly describes the limitations of its rule:

The NRC required that the licensee submit this information in the form of a PSDAR, which consists of the licensee's proposed decommissioning activities and schedule through license termination, a discussion of the reasons for concluding that the environmental impacts associated with the proposed site-specific decommissioning activities will be bounded by appropriate previously issued environmental impact statements, and a decommissioning cost estimate for the proposed activities. The NRC makes the PSDAR available to the public for comment and holds a public meeting concerning the PSDAR in the vicinity of the plant. *The NRC, however, does not approve the PSDAR and the submission of the PSDAR and its review by the NRC does not require the licensee to request a license amendment or any other approval.*

Proposed Rule at 87 Fed. Reg. 12259 (emphasis added).

After one reads many words, one comes to the real gist of the decommissioning plan. The NRC approves (or disapproves) of nothing. The public, the workforce, the State, all have no rights to

affect the plan or enact any changes or alterations that might address serious needs. This is a remarkable omission on the agency's part. Simply, the NRC exerts no regulatory authority on the PSDAR document other than acknowledging its existence and its receipt.

Commissioner Baran cited this exact text from our comments on the Draft Basis, and we see no reason not to make this same point here to the Committee:

In short, the NRC neither approves nor disapproves any of the industry's decisions or plans for decommissioning the reactor sites. And to the extent the details of the decommissioning plan are specified or outlined in the document, the NRC takes no action and has no authority to require more of anything, less of anything, or something altogether different as a consequence of the arrival of the PSDAR. Important decommissioning tasks such as deconstruction of the containment vessel, removal of the contaminated piping, moving the spent fuel from the pools, and the associated timelines for those activities, are left entirely in the hands of the license holder.

None of this is appropriate or adequate to the task and, frankly, it's a near startling abdication of regulatory authority. A postal clerk stamping the package "*Received*" is akin to what is on offer from the agency. The PSDAR should be subject to strict NRC oversight and approval; it should be a licensing action with associated environmental review and hearing rights; and community advisory panels with careful attention to workforce and local transition issues should be the bare minimum of public transparency. None of this should be controversial. This rule, if adopted in this form, would leave the communities, states, work forces, and every other party but the industry without a meaningful voice in the process. The NRC can and should do more in its important role as a safety regulator. Withdrawing this proposal and reissuing an improved proposed rule with a full environmental and safety characterization of the site, associated hearing rights, and the full plan for the community transition that will be necessary will go far to solve problems long before they start.

B. The Timeline for the Decommissioning Should Be Prompt and Use the Existing Workforce.

The NRC proposed rule makes no changes to the options for the timing of decommissioning. Rather, the proposed rule would leave 10 CFR 50.82(a)(3) and 10 CFR 52.110(c) in place and continue to allow decommissioning to be completed any time within 60 years of permanent cessation of operations.

Currently, a licensee may choose from three decommissioning strategies: decontamination (DECON), safe storage (SAFSTOR), or entombment (ENTOMB).

First, there is the decontamination (DECON) option, where after ceasing power generation operations and once it is safe to do so, the fuel is removed from the reactor vessel, all reactor and associated structures and components contaminated with radioactivity are either cleaned or removed and shipped to a licensed radioactive dump site, and as much of the reactor location as possible is returned to unrestricted use with all dispatch. Make no mistake, this process takes

years, or even more than one to two decades of work, and with the continued national stalemate on spent fuel (where both Senator Markey and NRDC have strong views that there is a consensus way forward under bedrock environmental laws),¹ complete unrestricted use is not a current option. But at sites like Maine Yankee and a few others, much of this has been achieved.

The second option is the safe storage (SAFSTOR) option, where the reactor is defueled but all associated parts of the facility are left in place *for up to six decades* for later decontamination and accomplishment of the vast majority of the work. The existing and knowledgeable (an often union organized) workforce is jettisoned; the community resources that rely on the longtime nuclear operations are done away with; and whatever environmental harms exist are left to fester for decades.

And finally, there is a third option. The entombment (ENTOMB) option, where the facility is basically covered over and left forever, is somehow still left on the table by the NRC. When we last spoke to the Committee on this topic eight years ago, we described the “extreme and challenging example of a version of the entombing option, at the contaminated Chernobyl Reactor in Ukraine.”² The ongoing land war in Europe and the attendant Russian troop disturbance of the massively contaminated site elicited worldwide concern and the pained attention of the International Atomic Energy Agency.³

Frankly, we expected that by the issuance of a proposed rule the SAFSTOR and ENTOMB options would have been jettisoned simply on the basis of common sense. As they still have not been, we say again now – the NRC should dispense with the ENTOMB and SAFSTOR options and require decommissioning begin as soon as feasible after a reactor permanently shuts down.

No American state, city, or community, no matter how much they might have benefitted from decades of power generated by a nuclear reactor, signed up for a permanent, extraordinarily contaminated sarcophagus along the lines of that at Chernobyl in Ukraine. As a society we have the capacity to address the risk and challenges associated with the demanding reactor cleanup and we should do so. Even entertaining the offer of letting the nuclear industry simply cover over

¹ See, <https://www.markey.senate.gov/news/press-releases/senator-markey-and-rep-levin-introduce-legislation-to-determine-a-viable-consent-based-path-forward-for-nuclear-waste>; and see also, NRDC’s statement on Senator Markey’s introduction of the “Nuclear Waste Task Force Act,” online at <https://www.nrdc.org/experts/geoffrey-h-fettus/step-toward-breaking-logjam-nuclear-waste>.

² See *Chernobyl, Capping A Catastrophe*, Henry Fountain, Photographs by William Daniels, The New York Times, April 27, 2014, online at <http://www.nytimes.com/interactive/2014/04/27/science/chernobyl-capping-a-catastrophe.html?action=click&module=Search®ion=searchResults&mabReward=relbias%3Ar&url=http%3A%2F%2Fquery.nytimes.com%2Fsearch%2Fsite%2F%3Dclick%26region%3DMasthead%26pgtype%3DHomepage%26module%3DSearchSubmit%26contentCollection%3DHomepage%26t%3Dqry926%23%2FChernobyl>.

³ See, *IAEA Chief Grossi to Head Assistance Mission to Ukraine’s Chernobyl Nuclear Power Plant Next Week*, International Atomic Energy Press Release, April 22, 2022; <https://www.iaea.org/newscenter/pressreleases/iaea-chief-grossi-to-head-assistance-mission-to-ukraines-chernobyl-nuclear-power-plant-next-week>.

a problem and walk away should be beyond the pale and not contemplated in any environmental rule issued in the year 2022.

And a sixty-year window of time where an industry can mothball a reactor and the attendant cleanup is a devastating proposition for a workforce that has spent decades servicing a huge, complicated facility, a community that has relied on steady revenues and taxes, and the obvious state interests in repurposing the land. The cleanup, whenever it does happen, is made more complicated and even potentially dangerous by having lost the expertise, knowledge, and familiarity of the existing workforce. And if, for example, prolonged cooling times are necessary for certain areas such as embrittled reactor vessels to protect workers and the community, a transparent decommissioning plan with hearing rights and full environmental review can well account for such contingencies.⁴

C. Ensure Funding for Decommissioning Is Adequate.

Decommissioning, a painstaking and complicated process that by any measure will take decades, is projected to cost in almost every instance more than half a billion dollars, and often in excess of \$1 billion dollars for each site.⁵ A few years ago, the Organisation for Economic Cooperation and Development, Nuclear Energy Agency wrote a report on the worldwide experience with decommissioning and had this observation on the matter of costs:

One main factor that adds complexity is the lack of globally coherent and reliable information on decommissioning costs, rendering the issue controversial. Since these costs will incur long after operations of a nuclear power plant have been discontinued and stopped generating income, expenses related to decommissioning constitute a future financial liability. From a governmental viewpoint, particularly in a deregulated market, *it is essential to ensure that money for the decommissioning of nuclear installations will be available at the time it is needed,*

⁴ Indeed, in its original basis for the rule in 2017, NRC pinned much of its analysis on Cobalt 60 and the following – “To date, 30 nuclear power reactors have permanently ceased operation. Ten reactors promptly completed decommissioning after ceasing operations. The remaining 20 power reactors have a collective ~483 years of being placed in SAFSTOR, with seven of these reactors remaining in SAFSTOR for an average of 40 years or more. Given that all of these reactors have and continue to be maintained safely in SAFSTOR, as demonstrated by the at least annual NRC inspection and oversight activities at each facility, the NRC staff has no reason to propose changing the Commission’s original determination that decommissioning can be completed safely at any time during the 60-year timeframe.” This 60-year timeframe should be addressed as a regulatory matter and not via agency guidance, and that a decommissioning plan drafted with stakeholder involvement and approved by the regulator would serve the role of defining the timeframes for decommissioning specific to individual reactor sites and the needs of host communities.

⁵ See the “*As Reactors Age, the Money to Close Them Lags*,” Matthew L. Wald, March 20, 2012, <https://www.nytimes.com/2012/03/21/science/earth/as-nuclear-reactors-age-funds-to-close-them-lag.html>.

and that no “stranded” liabilities will be left to be financed by the taxpayers rather than by the electricity consumers.⁶

Indeed, it is essential that the money should be available at the time it is needed and instead of heeding this concern, the proposed rule allows decommissioning funding status reports to be submitted every three years rather than every two; and it would also make it explicit that the licensee will identify (but not necessarily correct) any funding shortfall by the time of the next report. And last, the draft rule allows decommissioning trust fund assets to be used for spent fuel management as long as the trust fund exceeds the amount of the site-specific cost estimate.

All of this is unwise, and the prescriptions offered by Commissioner Baran in his disapproving vote could address much of the concern on the financial adequacy of resources going forward. For example, along with the obvious imposition of a requirement that any decommissioning funding shortfall be met within the reporting period, Commissioner Baran suggests a searching examination of moving away from reliance on the generic decommissioning funding formula. And constructively, Commissioner Baran suggests that the revised proposed rule should (1) require a full characterization at the time of shutdown to improve the accuracy of the cost estimate; (2) allow decommissioning trust fund assets to be used for spent fuel management only if there is a projected surplus and whatever is used is returned to the fund within an allotted time; and (3) prohibit the use of decommissioning trust fund assets for non-radiological site restoration until all radiological decommissioning is complete. Baran Dissent at 13, 14.

Of the reactors that have permanently shut down in the last decade, the costs for decommissioning are varying substantially for each. A decade ago the United States Government Accountability Office (GAO) issued a report where a top line finding was:

NRC’s formula may not reliably estimate adequate decommissioning costs. According to NRC, the formula was intended to estimate the “bulk” of the decommissioning funds needed, but the term “bulk” is undefined, making it unclear how NRC can determine if the formula is performing as intended. In addition, GAO compared NRC’s formula estimates for 12 reactors with these reactors’ more detailed site-specific cost estimates calculated for the same period. GAO found that for 5 of the 12 reactors, the NRC formula captured 57 to 76 percent of the costs reflected in each reactor’s site-specific estimate; the other 7 captured 84 to 103 percent.⁷

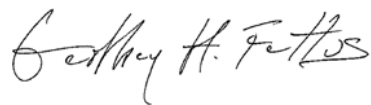
Put bluntly, a plausible risk exists that states and their taxpayers could be placed in a position where they have to foot significant portions of the bill to decommission, decontaminate, and

⁶ See, *Costs of Decommissioning Nuclear Power Plants*, OECD 2016, NEA No. 7201, via Organisation For Economic Co-Operation And Development, Nuclear Energy Agency, at 28 (emphasis added); found online at https://www.oecd-nea.org/jcms/pl_14910/costs-of-decommissioning-nuclear-power-plants?details=true.

⁷ *NRC's Oversight of Nuclear Power Reactors' Decommissioning Funds Could Be Further Strengthened*, GAO-12-258: published April 5, 2012, publicly released: May 7, 2012; online at <http://www.gao.gov/products/GAO-12-258>.

restore the reactor sites and degraded resources, and accept blighted and unproductive areas in their midst for generations that have been granted waivers for essential security and environmental safeguards. Rather than leave this burden to the states, we urge the Commission to withdraw the proposed rule and then reissue a new one in accordance with the recommendations of Commissioner Baran and the State of New York's 2010 comments,⁸ wherein NRC was urged to increase the strength and timeliness of the financial assurance monitoring regime so that decommissioning funds will not operate at shortfalls. Moreover, the Commission should adopt New York's wise suggestion that the formula by which decommissioning costs are estimated for each successive reactor should take into account "site-specific" factors such as the presence of contamination so that the ultimate costs will not be borne for decades to come by States and the surrounding communities.

We look forward to continuing to work with the Committee and all the parties at the table on this important matter that will affect dozens of communities, workforces and regional environments across the country for decades to come. I am happy to answer any questions.



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⁸ See *Supplemental Comments Submitted By The State Of New York Concerning The Nuclear Regulatory Commission's Proposed Decommissioning Rulemaking*; November 30, 2010, online at <http://pbadupws.nrc.gov/docs/ML1033/ML103350167.pdf>.